

Sinus of Valsalva aneurysm

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Abstract

Bicuspid aortic valve is one of the most common congenital cardiac anomalies and it may be accompanied by other cardiovascular anomalies. Sinus of Valsalva aneurysm is a rare anomaly in adult population, but it coexists with bicuspid aortic valve quite often. This report describes a 57 years-old patient who had a bicuspid aortic valve accompanied by unruptured Valsalva sinus aneurysm with significant left anterior narrowing and who underwent successful surgery with ascending aorta and aortic valve replacement as well as coronary by-pass grafting. (Cardiol J 2009; 16, 5: 455–457)

Key words: aneurysm, sinus of Valsalva

Introduction

Bicuspid aortic valve (BAV) is one of the most common congenital cardiac anomalies. It is well known that patients with bicuspid aortic valve have also an increased incidence of other anomalies. Sinus of Valsalva aneurysm (VSA) is a rare anomaly in adult population, but it accompanies bicuspid aortic valve quite often [1]. Frequently VSA is caused by congenital absence of muscular and elastic tissue in the aortic wall but it could be also acquired by a disease of aortic wall (infection, injury, degenerative disease). It usually remains asymptomatic until it has been ruptured. Unruptured sinus of Valsalva aneurysm may compress coronary arteries and thus present as myocardial ischemia [2].

We present a case of 57-years old patient who had a bicuspid aortic valve accompanied by unruptured Valsalva sinus aneurysm, with significant left anterior descending (LAD) narrowing and who underwent successful surgery with ascending aorta

and aortic valve replacement as well as coronary by-pass grafting.

Case report

A 57 year-old male presented with ‘de novo’ angina pectoris and a history of hypertension. Auscultation revealed 3/6 systolic murmur in the second right intercostal space and examination showed normal systolic and diastolic blood pressures. The electrocardiogram revealed left axis deviation, flattened T waves in III, aVF leads and J-point elevation. Transthoracic echocardiography (TTE) showed dilatation of aortic root up to 63 mm, left atrium enlargement (area 22 cm²), BAV with calcifications of aortic leaflets (Vmax 1.2 m/s, regurgitation grade 2+), interventricular septum and posterior wall thickening (12–14 mm) and tricuspid regurgitation (Vmax 2.43 m/s, Pmax 23.5 mm Hg). The results suggested the aneurysm of ascending aorta.

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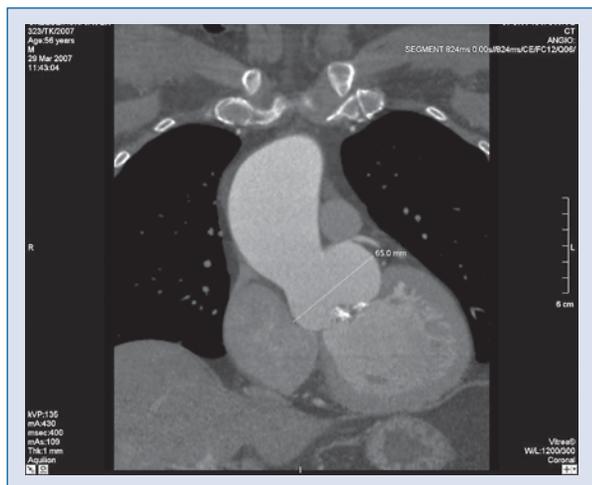


Figure 1. Aneurysm of left Valsalva sinus — MPR reconstruction.

To confirm this diagnosis, a 64-slice multislice computed tomography (MSCT) of the heart with contrast was performed. The MSCT revealed massive aortic valve leaflets calcifications, aneurysm of sinus of Valsalva (48 × 50 mm at aortic root level) and aortic diameter of 65 mm (Fig. 1). The diameter of aorta just below the origin of brachiocephalic artery was 48 mm, and descending aorta was 25–30 mm with no dissection features. Heart MSCT revealed calcium score of 69 Agatston units and separate origins of LAD and circumflex (Cx) artery from Valsalva sinus aneurysm. Moreover, the lumen of LAD was narrowed by more than 50% by atherosclerotic plaque (Figs. 2, 3).

Coronary angiography confirmed the diagnosis, revealing Valsalva sinus aneurysm, separate origins LAD and Cx with significant narrowing of LAD.

The patient was qualified for cardiac surgery. Using cardio-pulmonary bypass the left interior mamary artery-LAD by-pass grafting was performed and aortic valve and aortic root were replaced with coronary artery origins reimplantation (Bentall operation).

One month after the surgery, the patient was doing well. Physical examination showed no cardiac murmurs and TTE did not show any segmental contractility dyskinesia.

Discussion

Unruptured sinus of Valsalva aneurysms usually remain asymptomatic but they can cause a variety of clinical presentations such as atrial fibrillation, ventricular tachycardia, compression or



Figure 2. 3D-VR reconstruction of aneurysm of left Valsalva sinus, aortic root and ascending aorta.

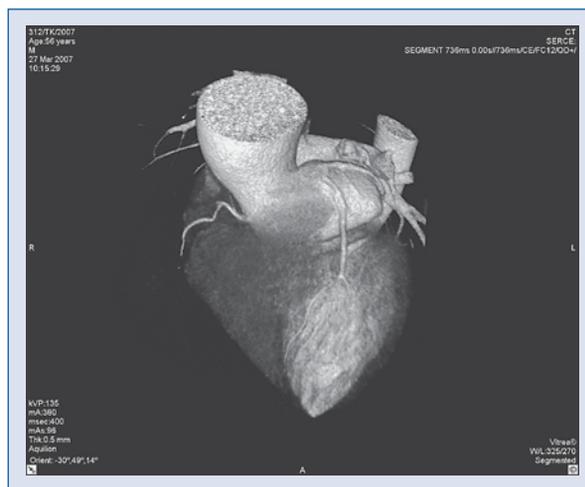


Figure 3. 3D-VR heart reconstruction, aneurysm of left Valsalva sinus, with visible origins of right coronary artery, left anterior descending and circumflex. Proximal left anterior descending stenosis.

stretching of coronary arteries causing ischemia, myocardial infarction and even sudden death, distal thromboembolism and stroke, heart failure due to outflow tract obstruction [3].

To diagnose this malformation, echocardiography, computed tomography or magnetic resonance imaging and cardiac catheterization may be needed [4]. Although there are no controlled trials on the treatment of unruptured sinus of Valsalva aneurysm, surgical treatment is chosen to prevent acute coronary obstruction, myocardial infarction, heart failure, rupture with sudden death, severe aortic incompetence and arrhythmias [2, 4].

The optimal treatment of unruptured aneurysm of sinus of Valsalva is under debate. Generally, closure of the aneurysm opening, replacement of the aortic valve and/or by-pass grafting are performed [4]. Surgical repair depends on various factors, such as whether the aneurysm is ruptured, the need to replace the aortic valve, and the presence of other conditions requiring surgery (such as coronary artery disease or aortic aneurysm). Even though we could not explicitly determine whether this is the primary Valsalva sinus aneurysm or an inferior extension of an ascending aortic aneurysm accompanying BAV, this was not a factor influencing the treatment method due to the patient's clinical status. In our patient, the replacement of aortic valve, ascending aorta and coronary by-pass grafting were successfully performed.

Conclusions

Cases of unruptured sinus of Valsalva aneurysms are rare. Further prognosis depends on proper diagnosis and prompt surgical intervention. 64-MSCT is a valuable method for establishing the diagnosis and determining the extent of surgical repair.

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References

1. Tzemos N, Therrien J, Yip J et al (2008) Outcomes in adults with bicuspid aortic valves. *JAMA*, 300: 1317–1325.
2. Lijoi A, Parodi E, Passerone GC et al. (2002) Unruptured aneurysm of the left sinus of Valsalva causing coronary insufficiency: Case report and review of the literature. *Tex Heart Inst J*, 29: 40–44.
3. Pepper C, Munsch C, Sivananthan UM et al. (1998) Unruptured aneurysm of the left sinus of Valsalva extending into the left ventricular outflow tract: Presentation and imaging. *Heart*, 80: 190–193.
4. Rhew JY, Jeong MH, Kang KT et al. (2001) Huge calcified aneurysm of the sinus of Valsalva. *Jpn Circ J*, 65: 239–241.